

CLAIMS

1. A method for isolating a gene encoding a membrane-bound protein, the method comprising the steps of
 - 5 (i) introducing into cells a vector comprising a DNA comprising a DNA encoding a secretable, functional protein having a binding affinity to an antigen and a cDNA ligated downstream of the 3' side of the functional protein-encoding DNA,
 - 10 (ii) expressing within cells, the fusion protein of the secretable, functional protein having a binding affinity to the antigen and the protein encoded by the cDNA,
 - (iii) selecting cells binding to the antigen by contacting cells expressing the fusion protein on the cell membrane with an antigen, and
 - 15 (iv) isolating cDNA inserted within the vector from the selected cells.
2. The method of claim 1, wherein the vector introduced into cells in step (i) is obtained by introducing cDNA into a vector at the restriction enzyme site downstream of the 3' side of the functional protein-encoding DNA.
- 20 3. The method of claim 1, wherein the vector introduced into cells in step (i) is obtained by introducing into a vector, a DNA comprising a DNA encoding a functional protein and cDNA ligated downstream of the 3' side of the functional protein-encoding DNA.
- 25 4. The method of any one of claims 1 to 3, wherein the DNA encoding the functional protein and the cDNA downstream of the 3' side thereof are ligated via a DNA encoding a peptide linker.
5. The method of any one of claims 1 to 4, wherein the cDNA is derived from a cDNA library obtained from mammalian cells.
- 30 6. The method of any one of claims 1 to 5, wherein the vector introduced into cells in the step (i) comprises a DNA encoding a secretion signal sequence upstream of the 5' side of the DNA encoding a functional protein.
- 35 7. The method of any one of claims 1 to 6, wherein the functional protein is an antibody.

8. The method of any one of claims 1 to 7, wherein the functional protein having a binding affinity to the antigen is a single-chain antibody.
9. The method of any one of claims 1 to 8, wherein the vector contains a DNA in which a DNA encoding the constant region of the antibody is ligated downstream of the 3' side of the DNA encoding a single-chain antibody.
10. The method of any one of claims 1 to 9, wherein the antigen is bound to a supporter.
- 10 11. The method of claim 10, wherein the supporter is for cell-culturing.
12. The method of any one of claims 1 to 11, comprising determining whether or not the gene obtained from cells comprises a novel sequence.
- 15 13. The method of claim 12 comprising screening a cDNA library to obtain the full-length gene of the gene obtained from cells, the gene comprising a novel sequence.
14. The method of claim 13 comprising isolating the full-length gene of the gene obtained from cells, the gene comprising a novel sequence.
- 20 15. A kit for isolating a gene encoding a membrane-bound protein, the kit comprising a vector having a restriction enzyme recognition site for inserting a cDNA downstream of the 3' side of a DNA encoding a secretable, functional protein having a binding affinity to an antigen.
- 25 16. The kit of claim 15 further comprising a supporter to which an antigen is bound and/or cells into which a vector is to be introduced.